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FUEL and POWER in Captive Middle Europe

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MID-EUROPEAN STUDIES CENTER *of the*

National Committee for a FREE EUROPE *Inc.*

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Foreword

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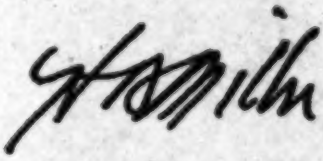
The Free World knows something about Russia's industrial potential. But the public at large is not well informed about the tremendous industrial revolution taking place in Middle Europe. What was generally thought of in pre-Iron-Curtain days as a primitive economy in a predominantly agricultural area is now in the throes of a brutal and painful but very real industrial revolution.

It has always been a maxim that one should not underestimate the enemy. This article has led me to believe that we may indeed be doing just that in regard to Russia's captive European empire.



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Author's Note

114 THE seven countries of Middle Europe now subjected to Russian control have been incorporated into the Soviet bloc against their will, and their Communist governments have been imposed upon them. This being the case, the author has refrained from describing this area of Europe and its component countries and nations as "satellite" and has adopted the term "captive" instead. The term "satellite" will be applied only to the Communist governments of that area.

The statistical data concerning the output of fuel and power in the captive area in the past are quoted — unless stated otherwise — from the United Nations *Statistical Yearbook* for 1948 and for 1949-1950, and from the United Nations *Economic Surveys of Europe* in 1949 and 1950. Data about the planned output and major investments in the captive area have been taken from the six national long-range economic plans and national plans for 1951, printed in several law journals and other official publications. This includes the revised versions of the Czechoslovak and Hungarian long-range plans (February 1951), and that of the Eastern German Five Year Plan (November 1951). Sources available to the reader are indicated in footnotes at the end of the text.

The German names of the cities and rivers in the area between the 1939 Polish-German frontier and the present Oder-Neisse boundary are given in parentheses following the Polish names; *e.g.*, Police (Pölitz).

The author wishes to thank Dr. V. Paulat of New York for certain data concerning Czechoslovakia, and Dr. G. G. Rosu of Washington, D.C., for information concerning oil production in Rumania.

J. H. W.

January 1952

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Introduction

121 SINCE 1948-1949 an industrial revolution has been taking place in the mid-European area now controlled by the satellite governments which in turn are controlled by Soviet Russia. According to the long-range plans adopted by the governments of Eastern Germany, Czechoslovakia, Poland, Hungary, Rumania, Bulgaria and Albania, several thousand new, large and medium-sized industrial plants (including mines and power plants) are being erected all over the captive area, while thousands of existing plants are being modernized, developed and extended. A score or two of the new plants under construction, or still in the blueprint stage, may be described as huge even by American standards. A large part of this program — possibly as much as half of it — had already been implemented by the end of 1951, with the result that the heavy industrial potential of the area has been doubled in comparison with that of 1938. At least, that is what the leading Communist economists of the area are claiming.[1] The other half of the program remains to be fulfilled by the end of 1954 or the beginning of 1955 when the present five or six year plans are expected to terminate in most of the captive area. Under relentless pressure of the Soviet Union, the satellite governments are doing everything in their power to fulfill and overfulfill the prescribed program if possible ahead of schedule. The issue of the armament race between the West and the Soviet Empire depends very largely on the success or failure of the industrial development of captive Europe.

The feasibility of this huge program depends in turn on the fuel and power at the disposal of the satellite governments at present and during the next few years. The captive area cannot count upon any large-scale importation of fuel and power from

121 outside — though there are small local exceptions to this rule — and must itself produce enough not only to cover all its own present and future requirements but also to export considerable amounts of coal and oil to Russia and Western Europe. As the demand for fuel and power for industry, transportation and domestic use is increasing fast, the captive area must develop its supply of fuel and power at a correspondingly rapid rate. If it does not, the long-range economic plans will not be fulfilled in time.

Theoretically, a large increase in the output of fuel and power is feasible. The mid-European captive area possesses considerable wealth in sources of fuel and power, a great part of which has not yet been fully exploited. Among these resources, the great Silesian coal field, now shared by Poland and Czechoslovakia, with its reserves equal to, if not larger than, those of the Ruhr basin in Germany, is undoubtedly the most important. The area also possesses enormous reserves of lignite in Eastern Germany and Bohemia, petroleum in Rumania, Albania and the Soviet zone of Austria, and considerable water power in the basins of the Danube, the Vistula, and the Balkan rivers. Because of its coal, lignite and water power, the area is already producing much electric power and is capable of producing in the near future twice or even three times as much, thus reaching the Western European level of production.

Practically, however, the implementation of the vast program is meeting with many difficulties, and will meet with more in the near future.

A more detailed analysis of the fuel and power production in the captive area, both actual and planned, follows.

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COAL

ALL six major countries of the captive area possess their own hard coal, but more than 80 percent of the coal reserves of this entire region are concentrated in the Silesian (also called Silesian-Ostravan) coal basin, where it has been mined since the late eighteenth century in an ever increasing quantity. The Silesian coal basin is one of the four major basins in continental Europe: its prewar production was surpassed by that of the Ruhr basin, but in turn exceeded that of the Donets basin in the Ukraine and of the Franco-Belgian coal basin.

For political reasons, a planned exploitation of the Silesian coal basin had for a long time been impossible. Until 1914 it was divided by state boundaries between Germany (which possessed the most valuable part of it in Upper Silesia), Austro-Hungary (the Ostrava-Karvinna coal fields and the so-called Cracow basin), and Russia (the Dombrowa basin in Russian Poland). The interests of the three great powers were, to say the least, not parallel; moreover, ethnic frontiers between the Germans, the Poles and the Czechs crossed the basin and caused serious tension. After the first World War the Silesian basin was redistributed, somewhat more along ethnic lines, among Germany, Poland and Czechoslovakia, and as a result of that division new political difficulties arose among the three powers. The Germans claimed the part of Upper Silesia which became Polish, and the Poles the eastern part of the Karvinna field which was adjudged Czech. In 1938 the latter mines were transferred to Poland, and in 1939 both the Czech and Polish coal fields, including those of Cracow and Dombrowa, were forcibly incorporated into "Greater" Germany. Between 1939 and late 1944 the entire Silesian basin was administered from Berlin and run as one unit. During these years, particularly in 1943, the produc-

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316 tivity of the basin achieved a level which has not been equalled since. It must be admitted, however, that during the last war the Nazis wantonly exploited the coal mines under martial law, with little regard for their future maintenance.

The Silesian coal basin, as such, suffered less damage from direct military action in 1944-1945 than from the strain on manpower, machinery, and installations during the years of war. In 1945 the whole of Upper Silesia was reunited with Poland. Its German population fled or was expelled westwards, while one million minority Poles were recognized as "autochthones" and stayed in Silesia. Since most of the coal miners in the formerly German western part of Upper Silesia belonged to that category, the mines could be worked without interruption. In 1945, too, the Kremlin adjudged the disputed eastern Karvinna mines to Czechoslovakia along the 1937 boundary. There are no Germans left either in Polish Silesia or in the Ostrava basin where they used to be numerous, but there are many Polish miners employed in the latter area. It should be stressed that the former German coal mines in Upper Silesia were situated not more than twenty miles from the prewar boundary, and that the Polish and Czech coal fields are not immediately contiguous. As a matter of course, the present division of the Silesian coal basin between the two Slav neighbors has far more justification from the technical point of view and may be regarded as stable.

[648] In 1947 the Warsaw and Prague governments agreed, in principle, to some measure of collaboration in coal mining, but no joint administration of the nationalized coal mines was created. It is possible that one of the difficulties was that the Poles produce in their part of the basin nearly four times as much coal as the Czechs in theirs, while any joint controlling body would have to be based on parity. In the last analysis, the coal policy of both Poland and Czechoslovakia in Silesia and elsewhere has been conducted since 1948 from Moscow, and there are Russian "advisers" with controlling power in Silesia as well as in all secondary coal basins of the captive area.

The level and character of the coal output in Silesia has always

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THE LEVEL AND CHARACTER OF THE COAL OUTPUT IN SILESIA HAS ALWAYS 316 433

been closely linked with political factors, which will continue to be of great importance in the future.

The peak production of the entire Silesian-Ostravan coal basin was reached under the German administration in 1943, when it yielded about 106 million tons of coal.[2] The decline of extraction began in 1944 and in 1945. With military operations being conducted in the basin itself, and the Red occupation gradually extending westward with all its overwhelming legal, administrative, and social consequences, the working of the mines was so disturbed that the basin produced only about 26 million tons. Since early 1946, however, the rise in production has been very rapid, particularly in Polish Silesia. The restoration of the productivity of the basin between 1946 and 1948 almost to its prewar level must be recognized as a remarkable technical and organizational achievement. The efficiency of the coal miners could not be raised to its prewar level (a characteristic feature of Communist economy) and the loss of many skilled miners, in particular those of German nationality, had to be made good by replacing them by scores of thousands of new, inexperienced men. The real difficulties began when the Warsaw and Prague governments were assigned the task of reaching the wartime peak of coal extraction and exceeding it within the frame of the Czech Five Year Plan and the Polish Six Year Plan. Even so the output of the mines kept growing, though at a slower rate, and in 1950 reached about 87 million tons (73 million tons in the Polish and 14 million tons in the Czech part of the basin), an increase over the 1937 figure.[3] Late in 1950 coal mining in the Ostravan part of the basin met with serious difficulties due to the shortage of manpower: the Czechs, like the French, and lately the British, dislike being coal miners. In the middle of 1951 these difficulties spread to the Polish part of the basin in the wake of food shortages. The subject is discussed in more detail later in this study.

According to the long-term plans, the output of the Silesian basin is expected to exceed the 1943 peak and to reach at least about 112 and perhaps as much as 118 million tons: 92 to 95

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316 433 million tons in Poland by 1955, and 20 to 23 million tons in Czechoslovakia by 1953. It can be assumed in advance that every effort will be made to fulfill the Polish plan ahead of schedule, probably by the end of 1954.

The Silesian coal fields are the basic source of hard fuel for the captive area as such and in particular for the two countries which share the basin. But there are in captive Europe a number of minor coal fields spread over this area outside of Silesia, whose joint output represents about one sixth of captive Europe's total production of coal. Even though their 1950 production did not exceed 14 million tons, the secondary coal basins of captive Europe are of decisive importance for such branches of industrial activity as cannot use lignite profitably as hard fuel, and because of their geographical location. In particular, a dozen or more iron and steel plants in Eastern Germany, Western Bohemia, Hungary, and Rumania, situated outside the Silesian-Ostravan basin or even far from it, largely depend on the supply of local coal in their operations.

Among these minor coal basins the following should be noted:

1. The Lower Silesian coal basin in Poland on the northern slopes of the Sudeten Mountains, also known as the Wałbrzych (Waldenberg) basin, with a present output of about 5 million tons of high grade coking coal;

2. The Zwickau-Oelsnitz basin in Saxony, with a present output of roughly 3 million tons;

3. The four minor coal producing areas in Bohemia (Kladno, Plzeň, Trutnov and Rosice basins) with a present joint output of some 4 million tons;

4. Several minor coal fields in Hungary, Rumania, and Bulgaria, with a total present output of about 2 million tons of hard coal.[4]

Since 1949 great efforts have been made to increase the production of these minor basins up to a joint level of approximately 20 million tons of coal at the end of the current long-range economic plans. Judging by the indices of production published by the satellite governments, the progress in these coal fields

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is uneven. The best performance to date has been that of the Saxon basin; the Hungarian and Rumanian output, though lagging behind the inflated annual plans, is described as growing rapidly; the Lower Silesian basin in Poland, where huge investments in machinery are being made, is apparently working in a satisfactory way; the secondary Czech coal fields were in the fall of 1951 several percent behind the prescribed targets.[5] The food crisis of 1951 is having a pronounced adverse effect upon the productivity of the minor Czech and Hungarian coal basins and may lessen that of the Lower Silesian and Rumanian mines. It may be assumed that if all these minor coal basins are capable of much development and extension, only some of them will be able to fulfill on schedule the very high quotas of production set by Moscow.

To sum up, at the end of the present long-range plans, that is on the average by the end of 1954 or beginning of 1955, the entire extraction of coal in all the basins of the captive area is expected to reach about 133 million tons and possibly a few million more.[6] This global target exceeds the prewar output of the Ruhr basin, and is equal to the output of the Soviet Union in 1938; it would be very much larger than the present output of the Donets basin in the Ukraine, estimated at less than 100 million tons.[7] The target of 133.5 million tons can also be compared to the output of bituminous coal in Pennsylvania in 1942 which reached 143 million tons.

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LIGNITE

135 The term lignite or brown coal[8] covers a number of class D
433 coals (international classification of 1913) of comparatively low caloric value. This does not mean that all lignites are poor quality coals; on the contrary, some of them, mined in Czechoslovakia, Hungary, Rumania, and Bulgaria, are "rich" lignites whose caloric value often reaches that of the class B semibituminous coals. That is why they are so often classified together with hard coal in local statistics. A British authority on coal, Sir Richard Redmayne, says that 2.8 tons of German lignite are equivalent to one ton of hard coal; according to the *Economic Survey of Europe in 1949*,[9] that ratio should be 4.5. The latter source says that 1.7 tons of Czech lignite and 3 tons of that from unspecified "other countries" are equivalent to one ton of hard coal. The last ratio seems to be too general because much of the Danubian-Balkan lignite is as good as the Czech. These discrepancies between qualified authorities are cited here as proof that an exact evaluation in terms of coal of the total caloric value of the lignite produced by the captive part of Europe is very difficult.

It should be borne in mind that lignite is a specifically mid-European type of fuel. In 1947-1949, the last years for which complete statistical data are available, no less than 65 percent of the world production of lignite, except that of the Soviet Union, was concentrated in the present captive area of Europe. This percentage may be even higher today; the extraction of lignite is growing in the captive area while, with a few exceptions (Western Germany, Yugoslavia, Australia) it remains stationary elsewhere.

The bulk of mid-European lignite used to be consumed in the production of electric power or converted into briquettes whose

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caloric value is generally twice that of lignite (the German classification: *Steinkohle*, 7,000 calories; *Braunkohle*, 2,500 calories; *Briquetten*, 5,000 calories). Since the first World War an ever increasing proportion of lignite is being used in Middle Europe as a base for the production of synthetic nitrate and as a cheap raw material for producing semi-coke, various tars, and synthetic oil.[10] Thus lignite has become a basis for the powerful electric plants and chemical industries of Eastern Germany and Czechoslovakia and, on a lesser scale, for similar industries in the Danubian and Balkan countries. The exception is Poland. There, little lignite has been extracted hitherto, though reserves are considerable, because of the abundance of hard coal. Lignite as such or in the form of briquettes has been used thus far instead of coal for domestic purposes, transportation, and in every industrial production but metallurgy. Now the satellite governments are on the verge of discovering a method of converting lignite into metallurgic coke. A great lignite coking plant at Lauchhammer in Eastern Germany and another in Borsod in Hungary, now under construction, are expected to be put in motion in 1952. Should this new method prove practical, Eastern Germany, Hungary, and Rumania would depend in the future much less on the importation of Polish and Soviet coke for steelmaking than they do now.

The deposits of lignite are spread over the captive area south of the Berlin-Warsaw line, and they are particularly rich in Saxon Lusace (Lausitz), Sachsen-Anhalt, Thuringia, and Bohemia. In the peak prewar year of 1929 Bulgaria produced 1.6 million tons of lignite, Czechoslovakia 22.6 million, Hungary 7.0 million and Rumania 2.7 million tons. Germany produced 174.5 million tons of lignite, of which approximately two thirds were extracted in what is now the Soviet zone and Polish Silesia. The total production of lignite in the present captive zone in 1929 reached 150 million tons. In 1943, the peak production year of World War II, the output of Bulgaria rose to 3.8 million tons, that of Czechoslovakia to 27.6 million, and that of Hungary to 11.2 million tons, while the output of Rumania remained stationary. The

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135 total output of Germany, again mainly Eastern, reached 250.7
433 million tons. The total 1943 output of lignite in the present captive area may be estimated as exceeding 200 million tons. In 1948 all these figures were much lower (except in Polish Silesia, which produced about 4 million tons) but had a marked tendency to increase. In 1949 Czechoslovakia produced 26.5 million tons of lignite, Hungary 5.5 million, Poland 4.6 million, and Rumania 2.8 million. The official figure of lignite production in Eastern Germany in 1950 was 137 million tons, and the total output of this fuel in the captive area could be estimated as reaching 185 million tons.

[185] The plans for 1953-1955 are as follows: Bulgaria is expected to produce 6 million tons of lignite in 1953, Czechoslovakia 38.8 million in 1953, Eastern Germany 225.2 million in 1955,[11] Hungary 25 million in 1954, Poland 8.4 million in 1955, and Rumania 7.7 million in 1955. The Czech and Eastern German targets are very high in comparison with their past and present output, and the Hungarian target seems to be unrealistic. Anticipating that the three plans to be terminated in 1955 may in fact be implemented earlier, a tentative figure of some 310 million tons of lignite may be accepted as that of the total output of lignite in the captive area to be achieved by the end of 1954 or the beginning of 1955. According to the ratios accepted by the *Economic Survey of Europe*, these figures would represent the equivalent of about 50.1 million tons of hard coal in Eastern Germany, 22.7 million tons in Czechoslovakia, and 12.1 million tons in the remaining four countries of captive Europe — a total of about 85 million tons. If other ratios were accepted as a basis for this computation, the total would be very much larger.

Together with the 133 million tons of hard coal which is the 1954-1955 target of the captive area, the grand total output of hard fuel for that area anticipated by 1954-1955 comes to 218 million tons of coal or coal equivalent, or more if the higher ratios of conversion are applied. Taken at its minimum, the goal of 218 million tons of coal or coal equivalent exactly coincides with the coal production of the United Kingdom in 1949, which was 218.5 million tons.

Unfortunately it is impossible to compare the present or planned global output of both coal and lignite extracted in the captive area of Europe with the corresponding output of the Soviet Union. The Soviet statistics do not make a distinction between coal and lignite, although there is considerable difference between the caloric value of anthracite extracted in the Donets basin, for instance, and lignite from the so-called Moscow basin or several other basins located in Asiatic Russia. The entire coal and lignite production of the Soviet Union in 1950 was 264 million tons, and that projected for 1960 is 500 million tons.[12] Both these figures include far more coal than lignite, but the exact ratio between the two types of hard fuel is not available. The anticipated production of 133 million tons of hard coal and 310 million tons of lignite in the captive area by 1954-1955, a total of 218 million tons in coal equivalent, can be put side by side with a tentative figure of some 380-390 million tons of coal and lignite which Soviet Russia expects to extract by the same time.[13] The Soviet figure is undoubtedly larger than that of captive Europe, but it would be hard to say what percentage the latter would represent of the former — perhaps 55 or 60 or even 65 percent. The only really valid conclusion is that hard fuel produced in the captive area constitutes an extremely significant addition to that mined in the Soviet empire proper.

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COKE

135 433 While at least two thirds of the Ruhr coal is of coking quality and thus can be used for steelmaking, this is not the case with the Silesian coal, only one third of which can be converted into coke. Moreover, the deposits of coking coal are concentrated in the western part of the Silesian-Ostravan basin. As a consequence, before World War II the German and Czech Silesias could produce much more coke than Poland in the eastern part of the basin. This situation has changed completely since the incorporation of German Upper Silesia into Poland. Outside the main Silesian-Ostravan basin there is much high grade coking coal in Lower Silesia, now Polish, and some in the secondary coal fields in Eastern Germany, Bohemia, Hungary, and Rumania. All in all, in comparison with Western Europe, the captive area is relatively poor in coking coal.

In 1929 Czechoslovakia produced 3,350,000 tons of coke, Poland 2,123,000 tons, and Rumania 72,500 tons; the output of Eastern Germany, which included German Silesia, was some 6,000,000 tons; that of Hungary was negligible, and Bulgaria produced no coke. The peak of war production in Eastern Germany was achieved in 1943, and in Czechoslovakia in 1944, when production reached almost 5 million tons. The last published figures of postwar coke production in Czechoslovakia date from 1948, when it reached 4,940,000 tons, and in Poland from 1949, when it reached 5,720,00 tons. Little coke was produced by the remaining captive countries, and figures pertaining to their output are not available.

Since 1948-1949, when long-range plans were launched for an extensive development of the steelmaking capacity in the captive area, the problem of its coke supply became more difficult. Eastern Germany, Hungary, and Rumania have to import

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coke from Poland and Czechoslovakia in order to cope with the demand of their steel plants, which have been rebuilt and are being extended. The exportation of coke interferes with the heavy requirements of the huge steel plants in the Silesian-Ostravan basin and puts much strain on the overworked railroad system of the captive area. As noted previously, the coal-poor countries of the area have to concentrate upon finding a practical method of converting lignite, of which they have much, into coke. It is probably premature to say that this problem has been successfully solved, or that lignite coke about to be produced on a large scale in Eastern Germany and Hungary will be as satisfactory for steelmaking as "ordinary" coal coke. Still, this minor technical revolution seems to be well on its way.

Not all satellite governments have disclosed their long-range targets for coke output. Among the large producers of coke, Poland expects to produce 9.9 million tons of coke in 1955 (in fact, earlier) and Czechoslovakia 8 million tons in 1952. This large increase of coke-making capacity cannot be achieved without the erection of many new coke plants. Several such plants of a very large size have already been put into motion in the Silesian-Ostravan basin or are still under construction. Eastern Germany anticipates for 1955 a production of 1.7 million tons of the new lignite coke[14] and of an undisclosed amount of coal coke which, on the strength of indirect indices, could be estimated at about 1.3 million tons. Rumania plans to produce 0.7 million tons of coke in 1955. The Hungarian target has never been disclosed — it cannot be high — and that of Bulgaria is negligible. It can be very tentatively estimated that the entire captive area expects to produce some 23-24 million tons of coke by 1954-1955.[15]

This tentative estimate may be compared with 19.9 million tons of coke produced by the Soviet Union in 1936 (the last known figure), and 44.3 million tons which was the top wartime production of Germany in 1943. France, without the Saar, produced only 8.2 million tons of coke in 1949.

It should be borne in mind that an average of about 1.4 tons

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135 of coking coal are required to produce one ton of coke, and
433 somewhat over one ton of coke to make one ton of steel.[16] In the light of these figures, should the captive area of Europe produce, as it plans, 23-24 million tons of coke by 1954-1955 — which depends on the amount of coal it will mine — it would have little difficulty in covering the requirements of its planned production of steel, estimated at about 16.5 million tons by 1954-1955.

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MANUFACTURED GAS

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THE term manufactured gas usually covers retort gas made in gasworks, carbureted water gas, and coke-oven gas when offered for public consumption, *i.e.*, not consumed by the plant which produces it. Blast furnace gas is not included in the international statistics of gas production which, incidentally, are generally incomplete. Properly speaking, manufactured gas cannot be regarded as a primary fuel, since coal must be consumed in its production. Many forms of gas used to be regarded as waste, however, and the increasing use of various types of gas is equivalent to the utilization of that waste and consequently to a better utilization of hard fuel. Germany has been the pioneer in that direction, and before the last war it produced some 40 percent of the world output of manufactured gas (in 1937, about 20,400 million cubic meters); by 1943, that output had risen to 27,380 million meters. A very large proportion of that gas was made in the present Soviet zone as a by-product of the synthetic oil plants. Elsewhere in the present captive zone the gas output was insignificant: in 1930 the Czechoslovak production was 112 million and the Polish 120 million cubic meters. But during World War II, faced with a shortage of hard fuel, the Nazi administration introduced new methods of exploiting manufactured gas throughout the occupied countries, and since that time its use has been increasing at a very rapid rate.

The Czechoslovak production of manufactured gas rose from about 960 million meters in 1945 to 2,189 million in 1949 and, according to the first, now obsolete, version of the Five Year Plan, was expected to rise to 2,900 million in 1953. This target was to be realized in 1951; further Czech plans are not known. Poland's output in 1948 — the last known figure — was 287 million meters. No figures concerning the planned production of

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382 manufactured gas have been published by the other satellite governments. It is known, however, that great emphasis is laid by the Eastern German, Hungarian, and Polish governments on an even higher output of gas, and the results obtained may be very high. For instance, gas manufactured by the synthetic oil plant at Most has replaced that produced by the Prague gasworks for use in the capital and its vicinity, allowing a substantial saving of hard coal.[17] Similar measures are being applied or planned elsewhere: for instance, long-distance manufactured gas pipelines were laid in 1951 in Poland.[18] Eastern Germany has made so much progress in the output of manufactured gas that the amount of it at the disposal of industry has been officially described as "more than sufficient" — the only basic commodity which Eastern Germany seems to have produced in abundance. Once the new lignite coking plant (or plants) are in full motion, a number of industrial plants hitherto working on electric power will use gas instead.[19]

Any estimate of the amount of manufactured gas to be produced by the captive area in 1954-1955 would be purely hypothetical. Considering the wealth of coal and lignite processed in that area, however, a tentative total figure of 8 million cubic meters would not be an exaggeration.[20]

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OIL

THE captive area of Europe is much less rich in oil than in hard fuel. At the same time its resources in oil are much larger than those of Western Europe. In the interwar period the principal oil fields of the present captive area were situated in Rumania, and the much less important ones in Southern Poland. The Austrian and Hungarian oil resources were not exploited; in fact, they were not known to exist. Rumanian production rose steadily and reached its peak output of 8.7 million metric tons in 1936; since then, the output has been decreasing. In 1938 Rumania produced 6.6 million tons of oil and Poland 0.5 million; in the same year, oil began to flow from the new fields in Austria and Hungary. In 1939 the eastern and richer part of the Polish oil fields (Drohobycz and Boryslaw) was annexed by Soviet Russia. During World War II the Nazis brought up the Austrian output to 1.2 million tons (1944) and that of Hungary to over 0.8 million (1943), but they were unable to increase or even to maintain the level of Rumanian production, whose war peak was reached in 1942 with 5.7 million tons.

Rumanian oil fields and refineries at Ploesti and its vicinity were heavily bombed by the Allies during the war, but the ensuing damage was on the whole speedily repaired. When the Soviet authorities took over the Rumanian oil fields in the fall of 1944, they began by seizing much of the drilling material and refinery equipment and removing it to Russia. In consequence, the productivity of the Rumanian oil fields was drastically impaired. For the same reason, the productivity of the Hungarian and Austrian oil fields (all Austrian wells are situated in the Soviet zone) also declined sharply. The initial Soviet policy of indiscriminate plundering, however, was soon replaced by one of rebuilding all mid-European oil wells under Russian control

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— including Albania — and exploiting them to the utmost of their capacity. Since then, except for the insignificant Czechoslovak and Polish oil fields which are run by local governments, the really large captive oil fields have been operated by Soviet or mixed semi-Soviet companies. This means that they are managed by Soviet specialists using Soviet machinery and installations, according to the Soviet methods of extraction, which the Russians regard as more progressive than those used in the West. A huge and ever growing amount of money and energy is being invested in the extention of the existing fields and the search for new ones. The Soviet idea seems to be that the foreign companies which operated the oil fields in the captive area in the past were only looking for immediate profits and never did their job properly and that there is bound to be more oil all over Middle Europe. Insofar as Rumania and Hungary are concerned, the results of the Soviet efforts cannot be considered remarkable. The output of Hungary remains stationary, while in Rumania, partly because of Russian haste and the harshness of their methods, there have been until the present time constant difficulties of every kind with machinery, organization, and manpower — perhaps even some sabotage.[21] The best proof of this is the fact that no statistics on oil production in absolute figures have been officially published in Rumania since 1947; had there been good reason for boasting, the figures undoubtedly would have been made known. On the other hand, there is much evidence that the Russians have been more successful in Albania, and even more so in their zone of Austria.

The present rate of oil output in Rumania, and for that matter in most of the other captive or Soviet-controlled countries (there is no oil in the Soviet zone of Germany), is the subject of much speculation.[22] Every authority has its own set of estimates, and there are surprising differences between them. Only a few of these diverging estimates can be quoted here. Thus the *Economic Survey of Europe in 1950*, an official publication of the United Nations — bound as it is to accept the indices occasionally given by the satellite governments and to draw its conclusions from

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them — estimates that in 1950 the Rumanian output of crude oil reached 5.35 million metric tons, that of Hungary (which lagged behind its plan for 1950) 0.55 million, of Poland 0.18 million, and of Czechoslovakia 0.05 million metric tons. Together with the Soviet zone of Austria, whose production the *Survey* estimates at 1.5 million tons, the total 1950 output of the captive area should have reached 7.63 million metric tons — plus that of Albania, for which the *Survey* gives no figure.

According to the other authoritative sources, the above-quoted figure on the Rumanian output reflects the nonfulfilled plans of the Rumanian government rather than the actual level of production. Competent Rumanian experts residing in the United States claim that the 1950 oil output in Rumania did not exceed 4.2 or perhaps even 4.0 million tons.[23] On the other hand, it is possible that the *Survey* underestimated the output of oil in Austria and Czechoslovakia. Thus, according to accredited American sources with access to much special information, the 1950 output of oil in the Soviet-controlled section of Europe was: Albania, 1,915,000 metric tons; Austria, 2,247,000 tons; Czechoslovakia, 275,000 tons; Hungary, 490,000 tons; Poland, 138,000 tons; and Rumania, 4,360,000 tons — a total of 9,415,000 metric tons. This total is larger than most of the other estimates because of the high figures for Austria and Czechoslovakia, and in particular because of the surprisingly high figure for Albania.[24] It should be noted that the corresponding figure for the Soviet Union in 1950 is presumed to have been 37,600,000 metric tons. If the above-quoted American estimate is exact, it would mean that the output of oil in the captive part of Europe amounts to as much as one fourth of that of Russia proper.

Whatever estimate is accepted for 1950, it may be assumed that the 1951 output of oil in captive Europe will be somewhat larger. It is true that according to official admissions the 1951 oil production in Czechoslovakia and Hungary has been lagging behind the plan, but this does not necessarily mean that it has fallen below the level of the preceding year. On the other hand,

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315 it is claimed that by the middle of 1951 the Rumanian output
135 was 19 percent larger than by the middle of 1950, and the
433 Polish output in the third quarter of 1951 was 11 percent larger than that of the third quarter of 1950.[25] Moreover, new oil fields were discovered recently in the Soviet zone of Austria at Schwardorf south of the Danube, opening up, it is asserted, "fantastic possibilities" for the future.[26]

It is not easy to have an accurate idea of how much oil should be extracted in the captive part of Europe in the light of the investments and other measures foreseen in the long-range economic plans. The current plans anticipate that in 1955 Rumania should produce 10 million metric tons and Poland about 0.4 million; Czechoslovakia plans to extract 0.15 million tons by 1952. The planned figure for Hungary has never been disclosed, and neither have been those for Austria and Albania, both of which produce oil for the Soviet Union. Yet it is certain that the Soviet authorities operating the oil fields in the three last-mentioned countries *must* have definite targets which they have to reach by the end of 1954, when most of the present long-range economic plans of the captive countries will, in fact, terminate. These targets, together with the three disclosed ones, may add up to any figure between 13 and 16 million metric tons of oil; that is, between about 94 and about 115 million barrels — an output depending on many unpredictable elements. A tentative figure of 13 million metric tons to be reached by 1954 has been adopted in this study as a basis for further computations.[27]

This estimate for 1954 — which may be a low one — should be compared with the 60 million metric tons of crude petroleum the Soviet government expects to extract in 1960.[28]

To the tentative figure for 1954 should be added the growing output of synthetic oil produced in the northern part of the captive area.

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NATURAL GAS

IN Europe, even more than in America, most of the natural gas extracted as a by-product of oil refining had been for a long time wasted, and its utilization for lighting, fuel, and extraction of natural gasoline is a comparatively new process. International statistics do not exist for its production but only for its consumption in the given states, which is supposed to be equal to its effective collection within the same boundaries.[29] In 1930 Rumania, with its consumption of 1,206 million cubic meters of natural gas, and Poland, with 487 million, were responsible for nearly one hundred percent of the total European output of this gas. Several long-distance gas pipelines were laid in Rumania. The pipeline connecting Daszawa in the Polish oil fields with Warsaw was still unfinished by September 1939; the Russians redirected that line to Kiev. During World War II the extraction of natural gas was started in the present Russian zone of Austria and in Hungary.

The last known statistics for gas production in absolute figures in Rumania date from 1947, when it reached 1,176 million cubic meters; in Poland (which lost to Russia two thirds of its oil fields) from 1948, when it was 162 million cubic meters; and in Hungary from 1947, when it was 100 million cubic meters; and in Austria from 1949, when it was 59 million cubic meters. The Rumanian output was then small in comparison with its peak in 1936, when it reached 2,130 million cubic meters. Since 1947-1949 no figures for natural gas extraction have been published by any captive or Soviet-controlled country, and some of the percentile indices disclosed by these countries are contradictory. There are reasons to assume, however, that there has been since 1947 a steady though slow increase of that production in Hungary and a much more rapid one in Poland and Rumania.

315 185 433 Thus, the increase of Polish production in 1950 over that in 1949 was officially described as "an enormous jump" and the output of gas in the third quarter of 1951 was alleged to have been 173 percent of that the whole year before. In Rumania the 1950 output increased, according to the official press, by 24 percent in comparison with that of 1949, and the output of the first half of 1951 was alleged to have been larger by one third than that of the first half of 1950.[30] It is not possible to check these assertions, but they may correspond to the truth. Rumania would not be building three plants for the chemical processing of gas unless there were good reasons for expecting an increase in the extraction of gas.

[185] According to their long-range plans, which officially terminate in 1955 but are expected to be fulfilled by 1954, Rumania anticipates extracting 3,900 million cubic meters of natural gas, and Poland 480 million meters. These targets are moderate in comparison with those foreseen for oil extraction. The Hungarian target for 1954 is unknown, and so is the Soviet plan for Austria. The Czech output is negligible. A hypothetical figure of some 5,000 million cubic meters of natural gas, almost entirely dependent on the unpredictable Rumanian output, is the best that can be surmised for the entire captive area in 1954.

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SYNTHETIC FUELS

With its comparative shortage of petroleum and its abundance of hard fuel, the captive area of Europe is capable — at least in part — of replacing natural liquid fuel by a synthetic one. The majority of German synthetic oil plants, not all of them completed before the end of the last war, were situated in the present Soviet-controlled area.[81] Out of thirty-two German-built plants of this kind, eleven were situated in the present Soviet zone of Germany, one in Bohemia, and five in present-day Poland. The first group of these plants utilized lignite or low grade coal according to the Bergius method. The plants in this group were generally built on a large scale and included the famous Leuna plant (one million ton capacity), the Magdeburg plant (600,000 ton capacity), two plants at Lützkendorf, the Zeitz and Böhlen plants in Eastern Germany; the Most (Brüx, one million ton capacity) plant in Bohemia, the Police (Pölitz, 600,000 ton capacity) near Stettin in Pomerania, two large plants under construction near Blachownia (Blechhammer) in Upper Silesia, and another plant under construction at Dwory near Oświęcim (Auschwitz) in Poland. Another group of plants, generally much smaller ones, utilized lignite by the Fischer-Tropsch method. Included were five plants in Saxony near Dresden and Leipzig, and a plant under construction near Blachownia. The three Blachownia plants and that of Dwory, construction of which started only when the Western German plants began to suffer from Allied bombing, were never finished and yielded only a fraction of the oil they were expected to produce.

Synthetic oil-producing in "Greater" Germany during World War II rose to the rank of an enormous industry. In 1939 Germany produced slightly over two million metric tons of

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382 synthetic oil; at the end of 1943, despite increasingly heavy Allied strafing from the air, this output increased to over six million tons, almost 80 percent of which was produced by the Bergius method. More than half, and possibly as much as three quarters of that oil, was produced in the present captive area, mainly by the Leuna, Most, and Pölitz plants. At that time the synthetic oil plants were consuming 16 percent of all electric power produced by "Greater" Germany, and used 10 million tons of coal and 60 million tons of lignite per year.

Nearly all these plants were heavily damaged during the last months of the war and some of them, like Pölitz, practically [727] destroyed from the air.[32] When the Russians moved into the present captive area in 1945, they dismantled all Polish and many German plants and sent their installations to Russia. The Most plant, taken intact, was declared war trophy and subsequently returned to the Czech government in exchange for the Jachymov uranium mines nearby.[33] All remaining German plants were taken over by the Soviet "state trusts." Several of these plants, like Zeitz and Schwarzheide, belong to the Soviet trust, "Synthese," while Leuna and Lützkendorf constitute special units. Though situated in German territory, the synthetic oil plants are operated under Russian management and may be considered for all practical purposes as Soviet property.

It is difficult to appraise the present capacity and production of the synthetic oil plants in the captive area, since information on this type of production is a closely guarded state secret. It is known, however, that the Leuna, Zeitz, Böhlen, and one of the two Lützkendorf plants in Eastern Germany,[34] as well as the Most plant in Bohemia and the Dwory plant in Poland, do produce synthetic oil on a much lesser scale than during the last war. They also produce the innumerable by-products made by plants of this kind. Speaking on the subject in January 1951, the Eastern German minister of heavy industry, Selbmann, said that he was proud of the "balance-sheet" of this type of industry and its performance in 1950: the annual plan was overfulfilled by 16 percent, with particularly good results at Leuna and

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Lützkendorf; the former was producing good automobile gasoline with 68 octane rating, and the latter turbine and other oils.[35]

According to the Five Year Plan as revised by the law of 1 November 1951, Eastern Germany produced in 1950, in round figures, 455,000 tons of gasoline and 439,000 tons of Diesel fuel, that is, 894,000 tons of synthetic liquid fuel.[36] There are reasons to assume that in practice this output might have been larger. The previously mentioned American source[37] estimates that in 1950 Eastern Germany produced 945,000 tons of oil, Czechoslovakia 350,000 tons, and Poland 135,000 tons, a total of 1,430,000 tons.

The official long-range plans for the two countries anticipate a Czech production of 525,000 tons of synthetic oil in 1953,[38] and an Eastern German production of 927,000 tons of gasoline and 650,000 tons of Diesel fuel by 1955;[39] that is, 2,092,000 tons of synthetic liquid fuel. To these figures must be added the undisclosed output of the Polish plants. The latter will depend largely on the amount of steel the Warsaw government will be able to assign to the construction of Polish plants; it is known that coal hydrogenation installations require a tremendous amount of steel. It may be that the total plan for the production of synthetic oil by 1954-1955 exceeds 2,500,000 tons. In fact, it may well be that the Eastern German plan underestimates the production anticipated by 1955: while it is in the Soviet interest to exaggerate for propaganda purposes the achievements and targets for all naturally produced sources of fuel and power in the captive area, the contrary may be true in respect to synthetic oil, if only for strategic purposes.

The captive area is capable of producing at least twice and perhaps even three times as much synthetic oil as projected in the long-range plans for its three northern countries. Even now, the capacity of several large synthetic oil plants, in particular of Leuna[40] and Most, exceeds by far the actual production. But the production of synthetic oil demands huge quantities of electric power and hard fuel, and until such power and lignite or coal are available for this particular purpose, the extension or

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even full utilization of the present plant capacity would be of little practical use. Another factor is that the cost of producing synthetic oil is very high in comparison with the cost of natural petroleum: a gallon of synthetic gasoline produced at the Most plant may cost as much as one dollar. Furthermore, Polish and Czech specialists in this domain are very few. Should the need of increasing the present production arise, however, the German and Czech plants are capable of much extension; the Dwory plant is being enlarged now, and the rebuilding of one of the Blachownia plants will probably be much advanced in the course of the present Polish Six Year Plan.[41]

Apart from synthetic oil, the captive area produces large quantities of benzol and industrial alcohol, both of which may be used as motor propellants. Eastern German, Czech, and Polish benzol producing capacity may at present exceed 200,000 tons per year and is capable of further increase.[42] The northern half of the captive area is the greatest potato producing area of the world, with a total output more than four times as large as that of the United States (in 1948, 49 million tons as against 12 million in the United States), and thus it is the largest potential producer of alcohol.[43] Current statistical data for alcohol production are not available.

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ELECTRIC POWER

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ELECTRIFICATION was Lenin's panacea for poverty and backwardness, and much of this belief has been accepted as gospel by the satellite governments, in particular those of the Balkan states. This theoretical attitude does not differ from that adopted in practice throughout the world. All over the globe, the installed capacity of the generators and the total production of electric energy have been increasing with great rapidity, especially during the last twenty-five years. The captive countries, with the obvious exception of Eastern Germany, have been under-invested in electric energy for a long time and thus have lagged considerably behind Western Europe. As their thermal and water power resources are on the whole no less than those of Western Europe, the extra emphasis on the output of electric energy by the present satellite governments can and should lead, within their current long-range plans, to a striking increase in that production. New hydroelectric plants will of course produce new energy, while the output of the new thermal plants will, as is commonly accepted, represent at least one-fifth more power than that which would be produced by direct combustion of the same amount of hard and liquid fuels. Without a sufficiently high output of electric energy, the huge chemical plants under construction in the captive area, the planned aluminum and special steel plants, and the railroads about to be electrified could not possibly be operated.

Coal and lignite are, and for a long time will be, supplying the great bulk of electric power in the captive area, since water power has not been hitherto sufficiently developed. The potential hydroelectric capacity of the area is very high in the Danube basin. Excluding Germany and Austria, it is evaluated at nearly 17 million kilowatts, *i.e.*, as much as that of the four Pacific coast rivers in the United States. The Vistula, the Oder, the

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Elbe, and the lesser Balkan rivers with their affluents within the present captive area are supposed to have a potential capacity of some 3 million kilowatts.[44] A large part of the Danube capacity is located in Yugoslavia, outside the captive area proper, and the great plan for harnessing the Danube at the Iron Gate — almost an equivalent of the Tennessee Valley system — is out of the question as long as Rumania and Yugoslavia, sharing the banks of the Iron Gate, do not cooperate on construction, which can only be a joint one. Yet with water power at the exclusive disposal of the satellite governments much can be done, and has already been done, to raise the percentage of energy produced thus far by hydroelectric plants.

In Eastern Germany the last hydroplants destroyed during the war, such as the regional plants of Niederwartha and Hohenwarte, are expected to be rebuilt soon, and plans are being made for the erection of new ones.[45] In Czechoslovakia, the huge Slapy plant on the Vltava River was completed in 1950, and another at Nošice in Slovakia is being built, in addition to a series of lesser hydroelectric plants at the Vah River; plans are being made for the erection of a huge plant on the Danube near Komárno, with a capacity of 500,000 kilowatts (the capacity of the famous Dnieper Dam is 558,000 kilowatts), and of another large plant on the Vltava River near Prague, supposed to supply power to Central Bohemia;[46] and power has second priority after the Big Ostrava metallurgical plant at Kunčice.[47] In Hungary a large hydroelectric plant is about to be completed at Tiszalök on the Tisza River; it is supposed to supply power to Eastern Hungary.[48] In Poland the Dychów (Deichow) plant on the Bober River, left unfinished by the Nazis, was already in production during the summer of 1951; when finished early in 1952, it will be the largest plant of its kind in Poland, and it will supply current to Lower Silesia and the Stettin area.[49] In Bulgaria two new hydroelectric plants of medium capacity on the Maritsa River were completed in 1950-1951, several more were supposed to be finished before the end of 1951, and thirty more plants of this type are supposed to be built within the

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present Five Year Plan.[50] In that country as in Rumania, electrification, based on water power, is regarded as the cornerstone of future industrialization, in accordance with an early Lenin formula for the Soviet Union. A Ten Year 1951-1960 Electrification Plan was recently adopted in Rumania, based in part upon the plans of the prewar Rumanian governments. The only one of its kind in the captive area, this plan anticipates the energy generating capacity of Rumania to reach 2.6 million kilowatts in 1960, *i.e.*, to be almost quadrupled. A hydroelectric plant at Stejar on the Bistritsa River is to be the main plant, with a planned output of 430 million kilowatt hours.[51]

The erection of hydroelectric plants is a slow business, and that is why a number of large thermal plants with much greater capacity will be constructed before the former are fully completed. It would be tedious to enumerate the projects now in construction or in the blueprint stage, the more so because they are not of comparable size and the available information about them is not sufficient. But some of the new thermal plants will apparently be huge. Among them are the great plants of Bergdorf, Kraftwerke Elbe, and Drattendorf in Eastern Germany, with a capacity of 150,000, 288,000 and 450,000 kilowatts respectively, not to mention the lesser projects. Kraftwerke Elbe has been given highest priority among all heavy industrial plants, the building or extension of which is foreseen in the economic plan for 1951.[52] Eastern Germany will spend 1.5 billion marks on the building of new electric plants in the course of its long-range plan, and the 1950 installed capacity is expected to be increased by 2,782,000 kilowatts by 1955.[53] In Czechoslovakia the Most plant, with a capacity of 350,000 kilowatts; the Ervěnice plant, supposed to cover the requirements of Prague and vicinity; the Třebovice plant for the Big Ostrava steel combine; the Barbara plant serving the Karvinna coal mines; and the Nováky plant for western Slovakia and another supposed to serve the HUKO steel combine now under construction in eastern Slovakia, will all be a very large size.[54] The huge Jaworzno II thermal plant, expected to be put in commission

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377 in 1952, will supply power for the new Cracow industrial region in Poland (the Nowa Huta steel combine, etc.); the present plants at Chorzów, Laziska, and Zabrze (Hindenburg), all in Upper Silesia, are being considerably extended; and the Miechowice plant near Bytom (Beuthen) now under construction is supposed to become ultimately one of the largest thermal plants in Europe; another plant of very large capacity is being built at Zeran near Warsaw. The Mátravidéki Erönü and Inóta plants in Hungary, and three plants in Rumania, including the one supposed to supply power to the Hunedoara steel combine, are also large plants under construction or already put in commission. At least fifteen plants are under construction, each of which will have a capacity exceeding 100,000 kilowatts and some as much as 450,000 kilowatts. The Dwory plant in Poland, which is being built jointly by the Poles and the Czechs and is expected to send a part of its output of current across the frontier to Czechoslovakia, will have an initial capacity of 140,000 kilowatts.[55] The Inóta plant in Hungary and the Zabrze plant in Poland are being built by the Czechs and will have Czech machinery. In many other plants, except in Eastern Germany and Czechoslovakia, the generators will allegedly come from Russia and will be installed (or have already been installed) by Russian specialists — at least that is what the local press repeats *ad infinitum*. Some of the largest plants under construction will not reach their full capacity before the termination of the present long-range plans and will apparently be extended further after 1955. All new thermal plants are supposed to work on lignite, low grade coal, and coal waste;[56] a large plant at Wizna in Poland, still in the blueprint stage, is supposed to work directly on peat. Many power plants in Poland are being connected by high tension grid, as they are already in Eastern Germany and the Czech provinces.

The following table illustrates the past, present, and planned output of electric energy in the captive countries:[57]

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Electric Energy In Captive Countries, 1930-1955

	1930	1943	1949	1950	Planned	Planned per capita
	(In millions of kilowatt hours)					*(In kwh)*
Bulgaria	95	340	815		1,800 *(1953)*	225
Czechoslovakia	2,993	6,660	7,514	9,100	16,500 *(1955)*	1,180
Eastern Germany	*c.* 10,000	*c.* 27,000	16,500	18,343	33,414 *(1955)*	1,755
Hungary	715	1,806	2,200		6,000-6,500 *(1954)*	630-680
Poland	2,906		8,146	9,540	19,300 *(1955)*	745
Rumania	550	1,271	2,500	2,766	4,700 *(1955)*	275
Total	*c.* 17,259		*c.* 37,675		81,700-82,200	870

It should be borne in mind that the Bulgarian plan is expected to be fulfilled by the end of 1951 or shortly afterwards,[58] and the Eastern German, Polish, and Rumanian plans, supposed to terminate in 1955, are being speeded up so as to be implemented ahead of schedule. With that correction, which influences the computation of the total, it can be seen that the total production of electric power in the captive area, which in 1930 somewhat exceeded 17 billion kilowatt hours and went up in 1949 to nearly 38 billion, is expected to reach about 82 billion kilowatt hours by the end of 1954 or the beginning of 1955.[59]

The 82 billion kilowatt hours of the planned production may be compared with 74 billion kilowatt hours reached in 1943 by Germany, 58 billion of the British production in 1951, and the estimated 1950 output of the Soviet Union of about 90.5 billion kilowatt hours.[60] The long-range target of power production in the Soviet Union is not known. The planned per capita production, averaging 870 kilowatt hours for the entire area, may be compared with the 1949 per capita production (in round figures) of the following countries: Italy 460, France 730, the United Kingdom 1,030, and the United States 2,300.[61] The per

377 capita production of electric power in the Soviet Union in 1950 did not exceed 430 kilowatt hours.

The satellite governments' plans for increasing the output of electric power are ambitious and farfetched. If they are implemented, the results of their fulfillment would by themselves exert a far-reaching and lasting influence upon the economy of the captive nations. Are they being fulfilled? The official statistics of the captive countries seem to confirm that thus far the planned rate of increase of the output of power in the captive area, with the exception of Czechoslovakia, has been maintained. Even in Czechoslovakia, which by the middle of 1951 had fulfilled only 94 percent of its plan for the first half of the year, the output of power is increasing in absolute figures. Thus in the first half of 1951, in comparison with the same period of 1950, the output of power is claimed to have increased by 6 percent in Poland, by 7 percent in Eastern Germany, by 10.7 percent in Czechoslovakia, by 15 percent in Rumania, by 19 percent in Hungary, and by 28 percent in Bulgaria. An output of far more power is anticipated in 1952, when a number of new large plants now under construction will be put into motion. Power production is one of the few major industries in captive Europe which has not yet suffered from the slowing down of general production since the summer of 1951. Of course, the lag in the output of coal in Czechoslovakia and Hungary and in the heavy electric machine building in Eastern Germany, as well as the present acute shortage of foodstuffs in most of the captive area, may sooner or later also have an adverse influence on the production of power and thus delay the execution of the long-range plans. But total states where the human element is but one factor of production have been known to mobilize all possible resources, regardless of cost in men or material, to fulfill their key targets. Power is undoubtedly one of the key targets.

Even if the present plans are entirely successful, only the western half of the captive area, approximately to the Danzig-Warsaw-Budapest line, will reach the relative saturation level in electric power which is one of the features of the progressive

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Western European countries. The possible demand for current 377
in wide areas of Poland and Hungary, as well as all over Rumania
and Bulgaria, will remain very largely unfulfilled. There are
many indications that the satellite governments intend to deal
with this problem in subsequent long-range plans.

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A SUMMARY OF ENERGY RESOURCES

371 A computation is possible — admittedly a tentative and approximate one — of the total sum of energy, *i.e.*, fuel and power, which the captive area of Europe expects to possess at the end of its several long-rang plans — more or less, by the end of 1954 or beginning of 1955. Such a computation can be made in terms of coal, in accordance with the ratios of conversion used in the statistical calculations of the United Nations.[62]

Considering all the secondary sources of energy (coke, manufactured gas, synthetic oil, thermal electric energy) as proceeding from the primary sources of energy (coal, lignite, petroleum, natural gas, hydroelectricity), the tentative table of the total primary energy of the captive area can be represented by the following figures:

Coal	133	million tons
Lignite	85	" " of coal equivalent
Petroleum	17.5	" " " " "
Natural Gas	6	" " " " "
Hydroelectricity	12	" " " " "
Total:	253.5	million tons of coal equivalent

These figures cannot, of course, be taken literally, since they are based on too many assumptions and arbitrary ratios of conversion, nor can they serve as a basis for any further computations. Their value lies in showing a student of the problem the proportions between the main components of the total sum of energy which the captive countries expect to possess as a basis for their industrial activity. Coal represents somewhat more than one half, lignite one third, and petroleum and natural gas not quite one tenth of that total energy. The table also permits the

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conclusion that more than one fifth of the total primary energy will by 1954-1955 be changed into electric power.[63] 371

Geographically speaking, the table shows that, in the domain of fuel and power, the Silesian-Ostravan coal basin represents about half the primary energy which the captive area expects to possess by 1954-1955, and far more than half the primary and secondary energy taken together. Very roughly speaking, Poland expects to produce by 1954-1955 about 40 percent of the total primary energy of the captive area, Eastern Germany more than 25 percent, Czechoslovakia about 20 percent, Rumania about 8 percent, and Hungary about 4 percent.[64]

It must be stressed once again that all these computations are highly approximate, and that they concern the *production* of fuel and power by the captive area and individual countries. The *consumption* of energy by the captive area and its components would be expressed by a quite different set of figures. Approximately one fourth of the coal produced in Poland and possibly more than half the petroleum produced by the area are being exported to Russia, Western Europe, and in lesser quantities to South America and the Middle East.[65] Some electric energy is sold by Western Germany to the Soviet zone,[66] and the Soviet Union will be supplying coke to Eastern Germany and possibly to Rumania. Also the figures for consumption of energy by the individual captive states would be quite different from the above-quoted national figures of production of energy. The computation of these figures lies outside the scope of the present study.

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AN APPRAISAL

371 FUEL and power are the basis of every industrial activity. Any increase in fuel and power production must of necessity be a rather slow business: new mines and electric plants, in particular those working on water power, cannot be built on short notice, and an increase in existing capacity is generally limited by technical conditions. Consequently, production of the overwhelming proportion of electric power in the captive area depends on the fuel available for the thermic plants producing the current. The Communist planners in the captive countries, constantly prodded by their Russian supervisers to produce more and more heavy industrial goods, have inaugurated very bold long-range economic plans which they themselves probably regard as not quite reachable. Irrespective of other material and human factors which influence and condition industrial production, such targets can be achieved only if sufficient fuel and power is produced by the captive area. If this essential premise fails, ambitious plans for machine building and chemical production will not be fulfilled.

Considered from this angle, the present level of fuel production — particularly of coal — in most of the captive area has not been very satisfactory ever since 1950, *i.e.*, since the initial stage of the several long-range economic plans. Apart from this apparently enduring insufficiency, a new reason for doubting that the fuel plans will be executed has arisen since the summer of 1951. The production of coal in the four central countries of the captive area (Czechoslovakia, Hungary, Poland, and Rumania) is directly threatened by a different sort of crisis, the first of its kind in this part of Europe since its submission to Soviet control. This is the acute shortage of foodstuffs. Both issues will be considered.

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"The output of coal increased in 1950 by 5 percent in comparison with that of 1949. Industrial production as such increased by 30.8 percent in comparison with 1949. It follows that industry grows far more rapidly than the production of fuel. At the same time, railroad transportation increases more rapidly than the output of coal. The demand of the market for coal as domestic fuel is also increasing . . . in 1950, the consumption of domestic coal was nearly 3.5 times as large as prewar. . . . At the same time, the demand for coal for exportation remains unchanged. . . . In that situation, the problem of increasing the output of coal, of fulfilling and overfulfilling the plan, must become one of the central issues of our work in 1951." This quotation comes from a speech of Hilary Minc, the economic master of Poland, which he delivered in February 1951, to introduce the economic plan for 1951.[67] There is no doubt that these words apply equally well to Czechoslovakia and all the other captive countries.

Probably the best economic brain behind the Iron Curtain, Minc realizes very well the danger of the situation. In his speech he offered a number of remedies: new investments (*i.e.*, new mines), higher mechanization and increased efficiency in organization and labor. There is no doubt, again, that as long as the discrepancy between the supply of coal and the demand for it by industry and transport remains the only reason for worry by the Polish or any other satellite government, these measures, which are already being applied, can improve the performance of the mines and increase the output of coal. Statistics show that output has been increasing in Poland by about 4 million tons per annum (1948: 70 million tons; 1949: 74 million; 1950: 78 million tons). But this rate of increase appears to be insufficient. Unless it can be accelerated, the target of 100 million tons of coal by 1955 (in practice, by 1954) will not be achieved. Moreover, even if this goal should be achieved, the planned output would not cover the demand as described by Minc.

It is a fact that even if the Communist economy functions at an optimum "normal" level the efficiency of labor in coal mining

316 and oil extracting cannot be raised above a certain point, lower than that of the prewar period, whatever the achievements in other branches in industry. Polish coal miners were the best in Europe: in 1937 the per capita production of coal was 0.8 tons daily in France and Belgium, 1.2 tons in Great Britain, 1.6 tons in Holland, 1.5 tons in Germany, and 1.8 tons in Poland; that of Polish Silesia was 2.0 tons daily.[68] Since the last war, despite great efforts, moral persuasion and flattery, and the bonuses, uniforms and medals with which the Warsaw government has cajoled the coal miners, at the same time threatening them with police reprisals, the individual productivity of the coal miners has never reached its prewar level. The postwar per capita production in Poland has never exceeded 75 to 80 percent of prewar figures,[69] and until the crisis of 1951 that level could have been regarded as more or less fixed. The performance of the Czech, Hungarian, and Rumanian coal miners has been, if anything, lower.

Even before the present crisis, since human nature cannot be influenced beyond a certain point, the satellite governments knew that they must replace the ineffective men by effective machinery. In this they have followed the experience of the Soviet Union, which for years had been suffering from the fluidity and inefficiency of labor in mining. There is much to be done in this respect. All over the captive area many mines are technically obsolete and not sufficiently mechanized, and production continues to depend in the last analysis on the human element. In these mines new methods of production are being introduced. Underground traction is being electrified, transmission belts installed, and machinery for winding and hoisting, sizing and washing is being introduced. Soviet mechanical coal cutters, the so-called Donbas coal combines, are expected gradually to replace the more antiquated methods of coal cutting.[70]

185 316 The best possibility for the satellite governments to increase the output of coal lies in the expected production of the new "scientific" coal mines which are being built in the course of the present long-range plans. Within its Six Year Plan

Poland alone anticipates the construction of eleven large mines 185
with a total annual output of 9 million tons of coal, and 36 exten- 316
sions of the existing mines with an output of 14 million tons. Of the former, 8 mines are presently under construction, each of them expected to produce 6 to 10 thousand tons of coal daily.[71] More money was invested in Polish coal mining in 1950 than during the years 1945-49 inclusive, and the 1951 investment is far larger than that of 1950.[72] Similar investments in the other captive countries are being made with increasing rapidity.

While the output of coal has been stimulated by all these 316
methods, efforts are being made to restrain the consumption of coal and to insure more efficient utilization. Since the middle of 1950, saving coal, in particular coal of good quality, has become one of the basic aims of the captive area's economy. The daily press eulogizes engineers and technicians who manage to operate factories and run trains on minimum quantities of coal or on low grade coal. All over the captive area, railroads and industrial plants substitute lignite or coal waste for hard coal fuel. In Soviet Berlin alone, the substitution of lignite for coal at the Klingenberg power plant will result in the saving of 500,000 tons of hard coal per annum.[73] At the same time electrification is being speeded up, since it will result in a lesser expenditure of fuel. During the last war, when the Nazis were faced with a grave fuel shortage, the "heat-engineers"[74] charged with this problem by the minister of armaments, Speer, introduced far-reaching improvements in the exploitation of the hydroelectric and thermal plants and saved up to 50 percent of the fuel and current.[75] Many of these men are available behind the Iron Curtain and, together with their colleagues from the other captive countries and with Soviet advisers, they are doing their best to wring the most they can from the local resources. When Selbmann, minister of heavy industry, states that the Eastern German thermal plants have reached the outside limit of load capacity,[76] the statement must be taken at its face value.

This analysis of the situation seems to lead to the conclusion 316
that under "normal" conditions the Communist regimes of cap- 433

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316 tive Middle Europe can gradually increase their output of coal,
433 and thus can assure a constant growth of their basic source of industrial energy. Much progress in that direction can be made through high investments and multiple technical improvements, as well as by better organization of production. But the "normal" conditions presuppose that the targets for coal output remain within the range of feasibility and the miners are assured of a minimum acceptable standard of living. In the course of 1951, either one or both of these conditions were not kept by most of the satellite governments, and the planned output of coal is at present exposed to considerable danger.

In February-March 1951, under relentless pressure from Moscow, the Czechoslovak and Hungarian governments were forced to decree a notable speed-up of their long-range industrial plans, equivalent to boosting their annual quotas of production from the beginning of 1951. The Czech 1953 target for coal has been increased from 20.8 to 25 million tons and that of lignite from 32.2 to 38.6 million; the Hungarian 1954 target for both coal and lignite from 24.2 to 27.5 million tons. *Ipso facto*, the annual targets for 1951, 1952, and future years, have been boosted accordingly. Since the old targets were already high, it is perfectly legitimate to doubt whether these new plans can be fulfilled in time. In the light of recent statistical data, Czech coal mining is fulfilling the old plan but not the inflated new one. The same seems to be true in Hungary.

433 Quite apart from the real or apparent unfeasibility of the
511 two coal plans in question, the recent acute food shortage in
466 most of the captive area (except in Eastern Germany and possibly Bulgaria) has resulted, since the early fall of 1951, in an appreciable lowering of the standard of living of all industrial workers, and of coal miners in particular. The reasons for this food shortage are many: one of them is a long period of drought in most of the captive area and the consequent loss of much of the potato crop, the staple food of the population. Even if the bread grain crops were satisfactory, the shortage of potatoes would be a major calamity for men and animals alike, and by

itself would lead to a shortage of meat, especially pork. This current emergency caught the satellite governments unprepared, the more so because they had been stripping their countries of foodstuffs by military stockpiling, sending vast amounts of meat, sugar, and other staples to Russia and Red China, and antagonizing the peasant producers of food by ever increasing taxes, supply quotas, and other forms of persecution and chicanery. The net consequence of such policies and practices is that in many industrial areas of captive Middle Europe the people have had very little meat since the summer of 1951. Their supply of sugar, vegetables, and potatoes has also been very short. The Polish, Czech, Hungarian, and Rumanian coal miners were already badly housed, badly clothed, and overworked. Now they are also badly fed, and they may be — or actually are — incapable of working as much as is expected. The lowered efficiency of the miners means less coal and less coal means in turn less electric power, less machinery, and less chemicals. A shortage of fuel may be equivalent to a nonfulfillment of industrial targets all over the four countries in question.

Statistical data naturally lag behind the real situation in industry. At the end of 1951 the available statistical figures were not yet fully reflecting the most serious consequences of the food crisis. However, they were indicative of a trend toward a depression in coal mining.

In Poland the coal target for the third quarter of 1951 was not fulfilled, and the actual production was only 2 percent higher than a year before, instead of the expected 5 to 6 percent. During the first half of 1951 coal extraction in Rumania was nearly 8 percent behind the plan, although it was claimed to be 26 percent above the output during the corresponding period of 1950. In the same period in Hungary coal was 6 percent behind the schedule, although again production was claimed to be 22 percent higher than 1950. In Czechoslovakia the slump in coal production was much more pronounced. It began by a temporary failure of production towards the end of 1950; even though it was overcome, the Czech government found itself unable

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316 433 to supply adequate supplementary manpower to the coal mines. In the third quarter of 1951 the joint coal and lignite plan was fulfilled only by 91 percent. Lignite mining was more or less satisfactory, but coal mining (in particular in the important Ostrava-Karvinna coal basin) was actually on the verge of a possible breakdown; by the end of October 1951, Czech coal production was 1.3 million tons behind schedule. Eastern Germany alone was implementing its coal plan.

[466] Faced with a direct threat to their planning, the satellite governments took, towards the end of 1951, a series of harsh steps. Their object was to assure higher wages and a better diet for the coal miners and to prevent the increasing absenteeism and bad discipline in the mines, as well as the increasing fluidity of manpower (in particular in Czechoslovakia and Hungary). Under the impact of these measures, the production curve in the all-important Silesian-Ostravan coal basin went upwards again in November and December 1951. It is possible that the Polish coal target for 1951 (somewhat above 83 million tons) was reached before the end of the year. It is doubtful, however, that the Czech target was reached. In the first weeks of 1952 it is too early to say whether this new production rise is temporary or permanent. It depends very largely on the supply of foodstuffs. The police states have at their disposal many effective methods of dealing with critical situations, but they cannot produce foodstuffs at will. It took the Soviet government years to overcome a similar situation in the Donets basin coal mining.

316 The production of lignite in the captive area is far less difficult for the satellite governments, in particular for Eastern Germany, which mines several times more lignite than all the other countries of Middle Europe combined. The explanation lies in the technique of extraction. The deposits of lignite generally lie close to the surface of the ground and can be worked by stripping and scraping from open mines, or they are covered by a shallow overburden[77] that must be removed before the mineral can be mined, as is true of some coal deposits in the United States. Only one fortieth of the nearly unlimited reserves of lignite in Eastern

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Germany (in particular in Saxon Lusace, or Lausitz) has to be mined from deep pits; the rest of it, lying on the surface or in shallow strata up to a depth of 165 feet, can be worked from open mines.[78] The main difficulty lies in removing and carrying away the overburden of soil, sand, and gravel; at present this sometimes amounts to as much as 12 to 15 times the volume of lignite extracted. Unlike those of coal, many lignite seams are very thick.

Most of the shallow strata of lignite are gradually being exhausted, and the ratio of overburden to lignite is slowly but surely increasing. However, many difficult technical and social problems of coal mining do not apply to lignite mining in the northern part of the captive area. This is also true, though not to the same extent, in Hungary and Rumania. The extraction of lignite, in particular in Eastern Germany, does not depend so much on an adequate supply of skilled miners as on machinery, and can be speeded up in proportion to the investment in mechanical excavators and transportation.[79] During the last war the Nazis stepped up the output of lignite by machinery and were able to cover huge requirements for electric power as well as for synthetic oil and rubber. Under present circumstances, the planned quotas for lignite in Eastern Germany and possibly Czechoslovakia can be met assumedly without too much difficulty. This may also be true for some deposits in the southern captive countries. Consequently, thermal electric plants in a large part of the captive area seem to be assured of a sufficient amount of fuel. It is true that hitherto lignite could not have been used in smelting, but the huge iron and steel "West-Kombinat" under construction at Calbe-on-the-Saale in Sachsen-Anhalt will be working exclusively on lignite.[80]

The oil production of the captive area depends on factors which are difficult to assess. The reserves of coal in the area are for all practical purposes unlimited, and new investments in coal and lignite mining, together with a propitiatory attitude towards labor, will always result in more coal being extracted. The pro-

315 duction of oil is different: there is no guarantee that new investments will produce oil. On the eve of World War II, the Polish oil fields were regarded as being gradually exhausted: between 1900 and 1938 their annual production fell from some 4 million metric tons to 0.5 million. The production of the much richer Rumanian oil fields fell from a peak of 8.7 million tons in 1936 to 5.2 million tons in 1943, and the prevailing technical opinion was that they had passed their production peak. The point of departure of the current long-range plans is that the new oil fields in Albania, Czechoslovakia, and Hungary (and Austria as well) can be developed almost at will, and that the exhaustion of the oil fields in Rumania and Poland can be halted and that production can be stimulated. The satellite governments and the Soviet experts who manage most of the oil fields take for granted that they contain much untapped oil, and that it can and will be extracted. More effort than ever before is being expended in the search for new sources of oil and in full exploitation of the [185] existing wells. According to the Rumanian Five Year Plan about five million feet of new drilling will be made in 1955, while in the top production year of 1936 new drilling reached only one million feet.[81] According to the same plan Rumania will manufacture most of its own oil mining machinery and make the installations in its plants. Altogether the equivalent of 860 million dollars will be invested in the Rumanian oil industry in the course of the current plan.[82] As noted above, the oil production hitherto obtained does not seem to confirm such optimism, especially in view of the fact that since the summer of 1951 the situation in the Rumanian oil fields as well as in the others, has been much complicated by the food crisis.

371 To sum up: after consideration of all data pertaining to fuel and power production in the captive area of Europe, both actual and planned, the following conclusions can be made. If the satellite governments do not fundamentally revise their attitude towards labor, especially during the present food crisis, and unless rapid technical and organizational progress is attained in hard coal extraction, the coal shortage may develop into a bottle-

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neck which will seriously threaten the plans for other branches of heavy industry. Throughout the captive area, with the exception of Eastern Germany, this is a grave problem. Whether it can be solved is an open question. The prospect for lignite is satisfactory. On the other hand, it seems improbable that oil targets will be achieved, mainly because of the present situation in the Rumanian oil fields. The production of electric power projected in the several long-range plans can be achieved without much difficulty if based on lignite and low grade coal which cannot be used for other purposes; with difficulty if based upon high grade coal, the supply of which may be insufficient. If based on water power, the production of electric power will depend largely on the investment in new hydroelectric plants.

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FOOTNOTES

[1] Hilary Minc, *A Fruitful Collaboration of Free Peoples*, quoted after *Pravda*, Moscow, by *Zycie Gospodarcze* (Economic Life), Warsaw, 1951, No. 19. Minc states that, in comparison with 1938, the total industrial output in the first half of 1951 reached 165 percent in Czechoslovakia, 208 percent in Rumania, 268 percent in Poland, 273 percent in Hungary and 335 percent in Bulgaria, while that of Albania reached 423 percent in 1950. The 1938 level of the industrial output in the Soviet zone of Germany was exceeded towards the end of 1950, and by the middle of 1951 might have reached 115 percent of the 1938 production.

[2] Jean Chardonnet, *Les conséquences économiques de la guerre*, Paris, Hachette, 1947.

[3] No detailed exact figures of the coal output in the Silesian-Ostravan basin can be given. It is not easy to distinguish it statistically from the global data of output in Poland and Czechoslovakia, both of which have coal mines outside of that basin. The annual and long-range plans of all captive countries are based only upon such global data and do not make distinction between the production of individual basins.

[4] Hungarian, Rumanian and Bulgarian statistics do not make sufficient distinction between black and brown coal. Figures concerning the coal output in these three countries are estimated according to the ratio between the output of the two kinds of coal as known from previous statistics. That ratio is supposed to be constant.

[5] During the third quarter of 1951 the plan for coal extraction in Eastern Germany was not entirely fulfilled, yet output increased by 11.5 percent in comparison with the corresponding quarter of 1950 (*Wirtschaft*, Berlin, 1951, No. 43). The minor Czech coal basins were by the end of September 1951, about 150,000 tons, *i.e.*, some 3 or 4 percent behind the prescribed target (speech by Premier Zápotocký, *Rude Pravo*, Prague, 1 November 1951). The Hungarian coal and lignite mines were 6 percent behind the plan for the second quarter of 1951, and 10 percent behind that for the third quarter (*Nepszava*, Budapest, 23 October 1951); yet an official report claimed that in the second quarter of 1951 the output of both black and brown coal exceeded by 22 percent that of the second quarter of 1950 (*Gospodarka Planowa*, Warsaw, 1951, No. 9); the Tatabánya black coal mines were responsible for almost half the coal deficit (speech by Rakosi, *Nepszava*, 23 October 1951). In Rumania the situation was apparently somewhat

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more favorable: although the output of black and brown coal was also lagging behind schedule, its extraction in the second quarter of 1951 was claimed to have exceeded that of the second quarter of 1950 by 26 percent (*Gospodarka Planowa*, 1951, No. 10). No detailed data are known for coal extraction in Bulgaria.

[6] 100 million tons (according to some indirect indices, 103 million) in Poland, 25 million in Czechoslovakia, 3.5 million in Eastern Germany, about 3 million in Hungary, about one million in Rumania, and about 0.5 million in Bulgaria. The Eastern German target, originally set at 4 million tons, was subsequently reduced to 3.5 million tons (the Law of 1 November 1951, *Wirtschaft*, Berlin, 1951, No. 44) — the only known instance of this kind. Yet various utterances of the chief planners in Poland and Rumania, and of Eastern Germany as well, leave little doubt that the long-range economic plans of these countries, supposed to terminate by the end of 1955, will be accelerated by one year, as has already happened with the Czechoslovak and Hungarian plans. In anticipation of that step, the writer assumes throughout his study that the figures of planned output in Eastern Germany, Poland, and Rumania in 1955 in fact pertain to 1954. An arbitrary but plausible figure of one million tons increase in the coal output in Czechoslovakia has been accepted for 1954 in comparison with the output planned for 1953.

[7] London *Economist*, 24 February 1951. According to the Soviet Fourth Five Year Plan, that figure should have been 86 million tons. Since the plan was overfulfilled, it was probably larger.

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[8] Most of the descriptive data on lignite comes from an exhaustive study by Sir Richard Redmayne, *Encyclopædia Britannica*, 1943, Vol. V. p. 878 ff.

[9] United Nations, Geneva, 1950, p. 231.

[10] Redmayne, *op. cit.*

[11] In its original version of 1950 the Eastern German Five Year Plan foresaw a production of 205 million tons of lignite by 1955. The new figure of 225.2 million tons in 1955 comes from the revised version of the plan as adoped in the law of 1 November 1951, (*Wirtschaft*, Berlin, No. 44, 2 November 1951).

[12] The first figure is based on the indices of the coal production in 1951 in comparison with the preceding years, as published by the Soviet press. The second comes from Stalin's speech of 9 February 1946.

[13] In his speech of 7 November 1951, Beria stated that in the course of the past several years the output of coal in the Soviet Union has been growing on the average of 24 million tons per year. (*Pravda*, 7 November 1951).

[14] The vast Lauchhammer lignite coking plant now under construction (and possibly some other new plants) is expected to produce 300,000

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tons of coke in 1952, 1,300,000 tons by 1953 and 1,700,000 tons by 1955 (speech of 31 October 1951, by Heinrich Rau, Eastern German minister of planning, *Wirtschaft*, Berlin, 1951, No. 44). However the rapidly growing requirements of the new Eastern German metallurgic plants cannot be satisfied by the two locally produced types of coke and a large importation of coke from Poland. In its four year trade agreement with the Soviet Union of 27 September 1951, the Eastern German government assured itself the importation of 250,000 tons of coke from Russia annually for the period 1952-1955 (*Wirtschaft*, Berlin, 1951, No. 42).

[18] An estimate of the writer, based on the assumption that most of the hard coal extracted in Eastern Germany and Hungary, as well as in Rumania, will be converted into coke. Thus, the huge steel plant at Dunapentele (Stalinváros) in Hungary, now under construction, is expected to be run on Hungarian produced coke, converted from the local Pécs coal. The demand for coke by that plant alone may exceed one million tons.

[19] *European Steel Trends*, United Nations, Geneva, 1949, p. 40.

[20] An unpublished study on Czechoslovak industry by Dr. V. Paulat of New York.

[21] National Economic Plan for 1951, *Dziennik Ustaw* (Journal of Laws), Warsaw, 31 March 1951.

[22] Heinrich Rau, speech of 31 October 1951, *Wirtschaft*, Berlin, 1951, No. 44.

[23] A conservative estimate of the writer.

[24] See the *Information Bulletin* of the Rumanian National Committee, Washington, for 1950 and 1951, and *La Nation Roumaine*, Paris, *passim*.

[25] Here are some of the non-quoted estimates: the *Review of International Affairs*, Belgrade, 28 March 1951 — 3.5 million tons; *World Today*, London, Royal Institute of International Affairs, April 1951 — 3.8 million; *Etudes et Conjonctures*, Paris, a semi-official publication, January-February 1951 — 4.3 million; *Gospodarka Planowa* (Planned Economy), Warsaw, February 1951 — 5.46 million tons. The Belgrade magazine is biased.

[26] The first figure comes from the Rumanian National Committee, *supra*, the second from Dr. G. G. Rosu.

[27] According to the *Wirtschaftsdienst*, Hamburg, June 1951, Albania planned to extract 306,000 tons of oil in 1950. According to Musil, the Albanian correspondent of *Wirtschaft* (Berlin, No. 48 of 30 November 1951), the Albanian extraction of oil reached 192,000 tons in 1948 and increased to 307,000 tons in 1950.

[28] Figures taken from recent official reports.

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[26] United Press from Vienna, quoted after *Anglo-Polish Review*, London, October 1951.

[27] An estimate of the writer, shared by some other researchers.

[28] Stalin's speech of 9 February 1946.

[29] United Nations *Statistical Yearbook*, New York, 1949-50, p. 145. This is no longer true. In 1945 pipelines were laid to convey natural gas from Rumania to the Soviet Union.

[30] Data for Rumania and Poland taken from the official reports on the fulfillment of the annual and quarterly plans.

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[31] Most of the data which follow are based upon Jean Chardonnet, *Les conséquences économiques de la guerre*, Paris, Hachette, 1947.

[32] J. A. Wilder, *Polish Regained Territories*, London, 1948.

[33] Dr. Paulat's study on the industrial development of Czechoslovakia, 1951.

[34] *Wirtschaft*, Berlin, *passim;* also advertisements in the Eastern German press.

[35] *Wirtschaft*, Berlin, 1951, No. 1.

[36] *Wirtschaft*, Berlin, 1951, No. 44 of November 2.

[37] See page 29.

[38] Speech of minister for planning, Dolanský, introducing the revised plan (end of February 1951).

[39] *Wirtschaft*, Berlin, 1951, No. 44 of November 2.

[40] Leuna plant employs 28,000 people, and is the greatest single plant in Eastern Germany. Karl Kühn (*Wirtschaft*, Berlin, 1951, No. 18) stated that Leuna could produce much more gasoline in 1950, because the installed capacity would permit such production, but that nitrogen-making had priority.

[41] Speech by Hilary Minc, *Trybuna Ludu*, Warsaw, 24 May 1951.

[42] United Nations *Statistical Yearbook*, New York, 1949-50. In 1937 Czechoslovakia produced 42,600 tons of benzol and Poland 31,100 tons; in 1936 Germany, outside the Bizone, produced 131,000 tons.

[43] *Ibidem*, p. 110.

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[44] Professor H. Herbich, quoted by S. Rotarski, "The Unexploited Resources of Europe," in *Eastern Quarterly*, London, January 1950. The four rivers are the Columbia, Colorado, Sacramento, and San Joaquin.

[45] Speech by Heinrich Rau on 31 October 1951. See footnote 14.

[46] *Trybuna Ludu*, Warsaw, 24 October 1951.

[47] Dr. V. Paulat. See footnote 17.

[48] Exhaustive data on that problem in *Wirtschaft*, Berlin, 1950, No. 51.

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[49] *Trybuna Ludu*, Warsaw, 1951, No. 151. 37

[50] National Five Year Plan, *Drzhaven Vestnik* (Journal of Laws), Sofia, 18 January 1949.

[51] Full data in *Wirtschaft*, Berlin, 1950, No. 46. 377

[52] Speech by Rau. See footnote 14.

[53] *Ibidem.*

[54] Dr. V. Paulat.

[55] *Ibidem.*

[56] Data concerning the plants under construction in Poland, Hungary, and Rumania have been taken from various sources in the current press of these countries.

[57] The figures for 1930 and 1943 are taken from the United Nations *Statistical Yearbooks* and the planned figures from the national long-range plans. Those for 1949 and 1950, if not supplied by the *Statistical Yearbooks*, were gathered from a variety of sources in the press of the six captive nations and, indirectly, from interpretation of the plans, in particular those of Bulgaria and Hungary.

The 1930 and 1943 figures for Eastern Germany are estimates of the writer, based upon indirect indications; these figures include the part of Eastern Germany which became Polish in 1945. The power output of the present Soviet zone of Germany in 1938 reached 17.2 billion *kwh*, according to the United Nations *Economic Survey of Europe* in 1950. The Eastern German Five Year Plan, in its revised version of November 1951, foresees that the power output in 1955, to the extent of 33,414 million *kwh*, will be equal to 182.7 percent of the output of power in 1950; it follows that the latter reached 18,343 million *kwh*.

The planned per capita output was obtained by dividing the planned output in absolute figures by the estimated number for the population of a given country in a given year. The total population of the captive area (without Albania) at the beginning of 1951 was almost exactly 90 million; it is presumed that by 1955 it will exceed 94 million. The margin of error in this computation should not exceed, in the opinion of the writer, three to four percent.

From various indirect indications it can be surmised that, in 1951, Eastern Germany expects to reach a power output of about 21 billion *kwh*, Poland about 10.8 billion, and Hungary almost 3 billion. No such computation could be made for Bulgaria, Czechoslovakia, or Rumania on the basis of the material at the disposal of the writer.

[58] R. Damianov, *Bulgaria*, Sofia, 29 January 1951.

[59] The estimate of 82 billion *kwh* is but the sum of the six targets supposed to be reached on various dates. At the same time, it may be safely assumed that this figure does represent a joint target of the captive area to be reached by the end of 1954 or the beginning of 1955. The following reasons seem to lead to such a conclusion:

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377 1. It may be taken for granted that every effort will be made to fulfill the Eastern German, Polish, and Rumanian plans one year ahead of schedule, that is, by the end of 1954 or beginning of 1955.

2. It may be expected that, having fulfilled its plan for power by the end of 1951, Bulgaria will launch a new plan which may aim at an output of about one billion *kwh* more by the end of 1954 or the beginning of 1955 — an entirely justified supposition.

3. It is true that the output of 16.5 billion *kwh* which Czechoslovakia plans to reach in 1955 cannot be accepted as its target for 1954 or beginning of 1955, and a much lower figure should be taken instead.

4. But the larger Bulgarian and the lower Czechoslovakian figure may compensate one another, especially if a lower figure of the Hungarian output in 1954 (6,000 million *kwh* instead of 6,500 million) is accepted as the basis for the tentative computation.

Under the circumstances the writer regards the mere arithmetic sum of the six national targets, equivalent to more or less 82 billion *kwh*, as an entirely acceptable hypothesis: the margin of error should not exceed one billion *kwh*.

[60] Harry Schwartz, *New York Times*, 23 January 1951.

[61] Estimates of the writer.

371 [62] *Economic Survey of Europe in 1949*, United Nations, Geneva, 1950, p. 231.

[63] 82 billion *kwh* represent the equivalent of somewhat over 50 million tons of coal (1,590 *kwh* equivalent to one ton of coal, see footnote 62). This figure corresponds to a general figure for Europe; see p. 12 of the same *Survey*.

[64] Estimates of the writer.

[65] Silesian coal has been exported for generations, and trade in it flourished between the two World Wars. Industrial production and railroad transportation in the countries named depend to some extent on the specific technical quality of Polish coal.

[66] 800 million *kwh* from Hamburg and West Berlin, according to *Wirtschaftsrevue*, Karlsruhe, 15 December 1950. See also footnote 14.

371 [67] *Trybuna Ludu*, Warsaw, 1951, No. 53.

433 [68] *Statistical Yearbook of Poland*, 1939, p. 239; also *European Steel*
316 *Trends*, United Nations, Geneva, 1949, p. 51.

[69] Evaluation by Alfred Zauberman, *Dziennik Polski*, London, 1951.

[70] The production of the Donbas combines began in 1951 at the Piotrowice plant of heavy mining machinery in Poland (*Wirtschaft*, Berlin, 1951, No. 32) and in at least one of the corresponding plants in Czechoslovakia.

185 [71] *Trybuna Ludu*, Warsaw, 1951, No. 160.

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[72] National Plan for 1951.
[73] *Wirtschaft*, Berlin, 1951, No. 21.
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[74] Chardonnet. The German word is "Wärme-Ingenieure."
[75] *Ibidem.*
[76] *Wirtschaft*, Berlin, 1949, No. 13.
[77] The German technical word is "Abraum."
[78] Max Fritsch in *Wirtschaft*, Berlin, 1951, No. 32.
[79] Redmayne, *op. cit.*
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[80] *Wirtschaft*, Berlin, 1951, No. 40.
[81] *Rumanian Information Bulletin*, Washington, 25 January 1951. 185
[82] *Ibidem.*